

MARINE REVIEW.

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No. 1.

Gen. Poe Objects to a Memorial.

As might have been expected, Gen. Poe makes emphatic objection, in a courteous way, to the proposition that a memorial of some kind be erected in his honor at the St. Mary's Falls canal, upon the completion of the new lock, which is to be a crowning feature of the canal work. He does not, however, object to the suggestion that the Lake Carriers' Association take action towards retaining his services until the several important works under his charge are completed. It is understood that several United States engineer officers have been kept in active service after the date of their retirement, by act of congress, and effort with this end in view will be made by lake vessel owners. The General's objection to the suggestion of a memorial is contained in the following letter to Mr. Keep, secretary of the Lake Carriers' Association:

Mr. C. H. Keep, Secretary Lake Carriers' Association, Buffalo, N. Y.—Sir: The MARINE REVIEW of the 27th inst. publishes a paragraph headed "A Poe Memorial," stating that a movement is on foot amongst the Lake Carriers' Association, having for its objects, first, to retain me in service after the date of my retirement, March 7, 1896, until the completion of the more important works now under my charge, and second, the erection of a memorial to me at Sault Ste. Marie. To the first of these I make no objection, as I hold my services at the disposal of the people of this country just as long as they want them. To the second, however, I make the greatest possible objection. If the new lock proves as successful as I hope, it will, itself, be the best memorial; if unsuccessful it should not be emphasized.

I beg you to do what you can towards putting a quietus upon the matter of any memorial. I write you because you are in a position to accomplish what I desire. I appreciate beyond the possibility of expression the kindly feeling evinced by the vessel interests towards me during recent years and would not do or say anything to seem unappreciative. But I trust the memorial matter will stop right where it is. After the new work has proved entirely successful, a simple resolution of satisfaction limited to a dozen words, and adopted by the organized vessel interests, would gratify me, and would constitute all the reward I desire.

United States Engineer Office,
34 West Congress street,
Detroit, Mich., June 29, 1895.

O. M. POE,
Colonel, Corps of Engineers,
Bvt. Brig. General, U. S. Army.

A Few Points Regarding Hydrographic Office Charts.

Ensign W. L. Cole, U. S. N., who is in charge of the branch hydrographic office at Cleveland, sends the REVIEW the following short story on the subject of Mercator projection, which is the projection upon which most of the charts of the hydrographic service are built:

"The aim of the hydrographic office in the publication of its charts and 'sailing directions' is limited to meeting the needs of nautical people. In publishing its 'sailing directions' of the great lakes, it has adopted for those charts Mercator's projection, which is commonly used for nautical purposes. It is impossible to represent with great precision on a plane surface like that of a chart any large part of the earth's surface. There will be distortions of one kind or another. Of the different kinds of projections or developments that may be used for charts, each has its advantages and its disadvantages. In choosing, reference must be had to the special purpose for which the chart is intended. Independently of the most important property of the Mercator projection to be described herein, it has always commended itself to seamen for the reason that the meridians and parallels are represented by straight lines, and do not, therefore, suggest confusion.

"In every kind of chart that has commended itself to mariners in modern times, the straight line represents the track to be followed from place to place, and the peculiar excellence for purposes of navigation of the Mercator projection, upon which the new charts of Lakes Huron and Superior are constructed, lies in the property that any straight line that may be drawn to represent a track crosses every meridian at the same angle, so that a vessel navigated by this chart maintains the same true course throughout her passage along any straight line. This condition, namely, keeping the course constant, is the most convenient in practice, and, besides, produces in all the calculations in which the place of the ship is concerned the utmost simplicity of which they are capable; and the mariner, in making passages of short duration, such as are required on the great lakes, is thus rid of all resort to astronomical navigation which mainly consists in finding his geographical position from observations of the heavenly bodies and from time carried by chronometers.

"In every other kind of nautical chart the straight track line, unless it coincides with the meridian, crosses the successive meridian lines at varying angles, and in order to follow the course that is laid out it is necessary to alter the true course from time to time as the ship proceeds upon her voyage. To make the required alteration in the course it is necessary to know the latitude and longitude of the position of the ship, and for the finding of these elements vessels navigating the waters of the lakes are not generally equipped.

"This chart will provide the maximum facility for navigating under the conditions that prevail on the waters that it covers, for in finding the direction in which the vessel is to be steered it is only necessary to draw a straight line from the place of departure to the place of destination, transfer the direction of this line to the center of the nearest compass rose, by means of a parallel ruler, and read upon the outer row of subdivisions of the compass rose the angle that this line makes with the meridian lines engraved upon the chart. This is the true course, and it remains the same throughout the passage, but due allowance must be made in steering by compass on board a vessel, for the variation of the compass and the deviation of the compass, in the accustomed manner, which is well understood by navigators on the lakes."

Diamond Shoal Light.

Preparations are again being made by the light-house board for beginning the work of constructing a permanent light-house on Diamond shoal, at Cape Hatteras, for which the late congress appropriated \$200,000 and authorized a contract amounting to \$500,000 for its construction. It has been heretofore contended that the building of such a structure at this point was practically impossible, owing to the terrific strength of the storms which are characteristic of the locality. An eastern firm some years ago attempted to place a light-house on the shoal, but their work was swept away by a fierce gale. Lately the army engineers have made examinations on the spot and find that the project is entirely feasible. A good rock foundation can be found and it is thought certain that a steel structure firmly imbedded in the stone can be erected, which will be strong enough to weather the heavy gales and seas which visit that coast.

Upward Course of Prices in Iron.

The upward course of prices in iron and steel products is, of course, as interesting and important to vessel owners as it is to manufacturers in the iron industry. At this writing Bessemer pig iron is selling at \$13 a ton in the Mahoning valley, which means \$13.65 at Pittsburg. These figures are full \$3.50 a ton higher than the lowest figures reached during the depression of last winter. Similar advances have been recorded all along the line of manufactured products, but the most important event in the iron market is the general advance of \$2 a ton in steel rails. Railroad companies making further purchases of rails will be obliged to pay a higher price than if they had made contracts earlier in the year. The demand will probably be much heavier than for several years, not only on account of the improving prospects of the railroad companies, but also because advancing prices always stimulate buying. Rail mills long idle are now being put in condition for active operations, and these mills are, of course, heavy consumers of raw material.

On the 11th inst. the light-house board will open bids for a composite light vessel, No. 66, which is to be stationed off the entrance to the main ship channel of Boston harbor, but which is only 112 feet on the water line, and can, therefore, be taken through the Welland and St. Lawrence canals without difficulty of any kind if built on the lakes. Specifications for this boat were issued in March last and bids called for on April 11, but for some reason a contract was not let at that time. The boat was described and illustrated in the REVIEW of March 28, 1895. Her dimensions are 112 feet on the water line, 28 feet 6 inches moulded breadth and 13 feet depth of hold. The propelling engine, which will, of course, be of use only in moving the vessel to and from her station, or for handling her in case of accident that might remove her from her moorings, will be of about 350 horse power, and of the vertical inverted surface condensing type, with a single cylinder of 20 inches diameter and 22 inches stroke of piston. There will be two main boilers of about 300 horse power each and two auxiliary boilers of about 40 horse power each.

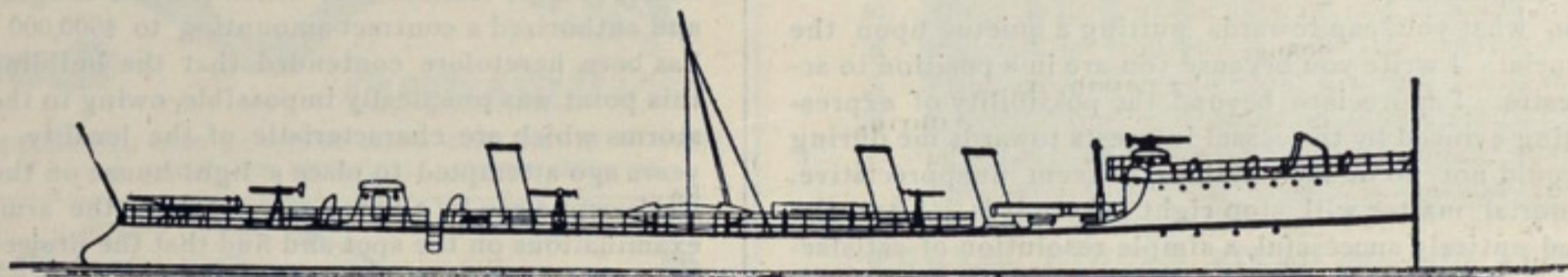
The third-class can buoy on Saunders' point shoal, near Gladstone, Lake Michigan, has again been placed in its proper position.

The New 26-Knot Torpedo Boats.

By an act of the last congress, provision was made for the construction of three torpedo boats, not to exceed in individual cost the sum of \$175,000. A rough sketch of the type of boat planned by the navy department under this act is printed herewith. It was taken from the Army and Navy Journal. As governmental superintendence, preparation of plans, and the providing and installing of ordnance outfit must be compassed by the appropriation, the bidding basis will be assumed no doubt to fall somewhere near \$150,000, and the present reasonableness of material makes it possible to get the boats constructed within that margin. They will have twin screws, each actuated by its own triple expansion engine working in a separate watertight compartment. The principal dimensions are:

Length on load-water line.....	170 feet
Beam, extreme, on load-water line.....	17 feet
Draught, mean, normal.....	5 feet 6 inches
Displacement normal.....	180 tons
Indicated horse power.....	3,200
Speed, in knots, an hour.....	26 knots

Bids are asked for under two classes. Class 1 embraces bids upon the plans and specifications prepared by the navy department, while class 2 embodies boats to be constructed in accordance with the designs of the bidder, the essential requirements of the government's design being assured. The craft will be built of steel or other metal, or of alloy, whichever the contractor, with the department's approval, may deem best fitted to this end in an economical distribution of strength and weight. The armament will consist of three torpedo tubes and mounts; four 1-pounder rapid firing guns; four automobile torpedoes; 600 rounds of 1-pounder ammunition; one stowing case. Forward, the freeboard is carried up to 12 feet 6 inches, and a forecastle deck runs from the stem aftward to the forward tower. The arrangement adds materially to the sea-going qual-



ONE OF THE NEW TORPEDO BOATS.

ities of the craft, while affording increased berthing facilities for the crew and a housing for the windlass and other gear forward.

Steam at a pressure of 250 pounds to the square inch will be supplied by three water tube boilers, two of which will be placed in a water tight compartment forward of the engines, with a common fire room between them, while the other boiler will be placed in a separate water tight compartment abaft the engine space. The normal coal supply will be twelve tons, with a bunker capacity, however, for sixty tons. Each boiler will have its own smokestack. The boats will have no search-lights, but will be lighted throughout by electricity, and forced draught for the boilers will be induced by blowers.

There will be no premiums offered for increased speed, but should the speed fall below the required 26 knots, and yet be above 25 knots, the penalty will be at the rate of \$10,000 a knot below 26 knots. Should the speed fall below 25 knots an hour the boats may be rejected, or, at the discretion of the secretary, accepted at a reduced price to be agreed upon by the secretary and the contractors. The time limit for construction is fifteen months from the date of signing of contract. Accommodations will be provided for four commissioned officers, four machinists and sixteen seamen.

Old Salts Object to Modern Customs.

Curiously enough, the old shellbacks in the navy are down on the homes for soldiers and sailors. They don't want "a snug harbor." They insist upon staying upon a cruising man-of-war, and when they die they want to be buried at sea. But the officers say that these old sea dogs are not at home on a modern cruiser, where everything is different from what they were accustomed to when they learned their trade. They object to the new-fangled equipment and the improvements and conveniences that have been introduced on modern vessels. They object to sitting down at a table and eating their meals off china plates with knives and forks, instead of taking their rations in little wooden tubs and squatting down on their haunches in the shelter of the lee gunwale while they cut their "salt horse" with a jack-knife. They object to scrubbing the decks with new-fangled rubber arrangements, instead of the old holystone, and refuse to obey electric signals because they have been accustomed to hear the officers yell at them from the bridge or the quarter deck.

Nowadays the galleys on board men-of-war are capable of cooking

fresh bread for the sailors every day, which is a serious grievance to the old-fashioned "Jackie," who prefers hardtack to raised biscuits and rolls. A large supply of fresh meats is carried in the patent refrigerators on board all the ships and served to the sailors, alternating with salt beef and pork, at least once a day. This is emphatically objected to by the veterans as an effeminate departure from the rations they received when they were apprenticed in historic times.

The sailors of a vessel that was recently in Montevideo and Buenos Ayres were served with tenderloin steaks for several weeks, because fresh meat was found to be cheaper than salt pork down in that great cattle country, but after about a week a committee from the forecastle waited upon the captain and said they desired to make complaint about the grub. He was much surprised at the suggestion, because he supposed they were being unusually well fed, and remarked that they were receiving the same supplies that were furnished himself and the officers of the ward-room. They admitted that this might be true, and added that it was exactly what they were "kicking" about. The boys didn't like tenderloin steaks; they "wanted something they could chaw on."—Chicago Record.

Changes in Aids to Navigation.

The red spar buoy marking Calumet entrance, north, off South Chicago has gone adrift, but will be replaced as soon as possible.

About July 6, the sixth-order fixed red light at the west side of the inner entrance to Big Sodus bay, Lake Ontario, will be moved to and exhibited without change of characteristics from the new structure recently erected at a point about 25 feet northerly from the tower now in use, and about 20 feet, respectively, from the east face and the south end of the west pier. The height of the focal plane of the light above mean lake level will be increased to 24 feet. The new structure is a white, square, pyramidal, wooden tower, surmounted by a lantern with a copper roof. The hand rail around the lantern is black.

The characteristic of the 10-inch steam whistle on the east end of the

west arm of the breakwater at Cleveland has been changed to sound, during thick or foggy weather, or when the entrance to the harbor is obscured by smoke, blasts of three seconds' duration, separated by silent intervals of fifty-seven seconds. As soon as practicable a sounding-board and reflector will be placed on the fog-signal house to throw the sound of the signal toward the lake in the direction of approaching vessels, and to reduce the sound in the city.

Fishermen's Superstitions.

The legends, quaint customs and superstitions connected with fish and fishing are many and curious. Ask a Scandinavian why salmon are red and have such fine tails. You will be told that the ruddy color of the flesh is due to the fact that when heaven was on fire the gods threw the flames into the water and the salmon swallowed them. The delicacy of the salmon's tail is explained by the story that Loki, when the angry gods pursued him, turned himself into a salmon. He would have escaped if Thor had not caught him by the tail. Salmon have had their tails fine and thin ever since.

Why are soles, plaice, and other flat fish brown on one side and white on the other? The Arabs of upper Egypt give an explanation which no one can hesitate to accept. One day, they tell you, Moses, the Israelitish lawgiver, was frying a fish—we all know the Jews are fond of fried fish, and they cook it splendidly. Moses, however, had only cooked his fish on one side, when the fire went out, and so he angrily threw the half-cooked fish into the sea. Although half broiled it came to life again, and its descendants—all the flatfish—have preserved today the peculiar appearance of their half-cooked ancestor, being white on one side and brown on the other.

Why do haddocks carry those peculiar black finger-marks near the head? Some tell us that they are a memento of the pressure of St. Peter's fingers, when he went fishing for the tribute money. On the Yorkshire coast they say the devil once determined to build a bridge at Filey. His Satanic Majesty did not start the bridge for the convenience of the people, but for the destruction of ships and sailors, and the annoyance of fishermen in general. In the progress of the work Old Nick dropped his hammer into the sea. Snatching at it hastily he caught a haddock, and all haddocks carry the imprint of his black fingers to this day.—Fisherman's Gazette.

After a Long Voyage.



REAR VIEW OF CAPT. JOHN OF THE LIBERTY WARE.

New Steamer to be Built by the Cleveland Company.

The Cleveland Ship Building Company has also decided to overstep the 400-foot mark in a new freight steamer for which material has just been ordered, and which is to be built on the company's account and offered for sale. Dimensions of the new boat are: Keel, 395 feet; over all, 415 feet; beam, 45 feet; hold, 28 feet. The boat will be built on the channel system throughout and will have no main deck, but the spar deck will be of steel. There will be no wooden ceiling but the tank top will be made heavier on that account. There will be twelve hatches of 24-foot centers. Deck houses will be of the ordinary freight steamer kind, similar to those of the steamer Yale now building at the same yard. Engines will be the same as those of the Kearsarge, Victory, Zenith City and Yale, the cylinders being 23, 38 and 63 inches diameter and 40 inches stroke. Two boilers, 14 feet diameter and 13 feet long, will furnish steam at 170 pounds pressure.

Lake Freight Matters.

The iron ore movement is still the main support of lake business, and although figures regarding June shipments will undoubtedly show the greatest output of ore ever recorded in a single month, there has been no surplus of boats and shippers have been kept busy warding off an advance in rates. Two or three times within the past week the rate from the head of Lake Superior has been on the verge of an advance to 90 cents, and the whole schedule of rates would go up in event of a demand for boats in the grain trade.

From all parts of the lakes comes evidence of the wonderful support given to lake traffic by the iron ore movement. Grain receipts at Buffalo during June were the smallest since 1886, and for the season thus far the receipts are the smallest since 1892. Receipts of all grains, flour included as grain, are nearly 10,000,000 bushels less than last season up to July 1. Coal shipments are close to 200,000 tons less than last year.

First of the 400-Foot Ships.

Now that the first of the several 400-foot steel freight steamers building in lake ship yards has been launched, a great deal of interest will be attached to the amount of cargo she will carry on St. Mary's Falls canal draft, as boats of this class will very probably be engaged almost entirely in the Lake Superior trade. The steamer Victory, built by the Chicago Ship Building Company for H. G. Dalton of Cleveland, and others, was launched at South Chicago on Saturday. It has been claimed that the Victory's load from Lake Superior on the present draft, a little more than 14 feet, will be close to 4,000 gross tons and that with a 20-foot channel, two years hence, this will be increased in net tons to about 6,000, but experience with big boats already in commission render these statements somewhat doubtful.

This boat, as well as her sister ship, the Zenith City, which will be launched during the present month, has already been described in the REVIEW. She is 380 feet keel, 400 feet over all, 48 feet beam and 28 feet hold. She has triple expansion engines, which were built by the Cleveland Ship Building Co., and which are capable of developing about 1,600 horse power. Her bottom construction is on the channel system, introduced by Sinclair Stewart, surveyor for the United States Standard Register, and she was built in accordance with the rules and inspection of the society publishing that register. She will present a long open deck,

suited to ready handling of cargo, as quarters for the crew, together with dining-room, steward's apartments, etc., are located below deck. There are no houses on deck excepting the Texas and pilot house forward. A turtle-back covering for the quarters forward extends only to the rail, and the same is true of the boiler house aft. There are eleven hatches, two of which are located forward between the turtle-back and the pilot house.

Miscellaneous Mention.

At the annual meeting of the Lake Superior Iron Co. in Boston last week a dividend of \$1 a share was declared. Dividends in the iron mining business have been scarce for two or three years, but the improved condition of the iron industry may result in a moderate sharing of profits by several of the leading companies before the year is at an end.

James Howden of Glasgow, Scotland, inventor of Howden's system of hot draft, has had printed in pamphlet form all the letters on the "Comparative Merits of Cylindrical and Water Tube Boilers," which had their origin in discussion resulting from a paper read at a meeting of the Institution of Naval Architects in London a year ago. A copy of the pamphlet may be secured from Mr. Howden or possibly from the Detroit Dry Dock Co., representatives of the Howden system in this country.

Now that work on that part of the 20-foot channel at the foot of Lake Huron, which includes a cut 2,400 feet wide, is nearing completion, it is suggested that an excellent way of lighting the channel would be to use two gas buoys, placing one at the upper and one at the lower end of the cut. The light-ship now stationed at this point could be moved to one of the numerous places where light-ships are badly needed and where gas buoys would be subjected to weather that might prove too severe for them. It is not at all probable that the Canadian government can be induced to erect ranges at the foot of Lake Huron to light the new cut, and our own government can not go into Canada and erect ranges.

Reports of operations of the life saving service for the treasury department year just ended are very flattering to this branch of the department, but it is, of course, well understood that the statistics are not very carefully collected. They show that during the year the total number of disasters to vessels at sea and on the great lakes was about 550. Of these 378 were on the Atlantic and Gulf coasts, 170 on the great lakes and twelve on the Pacific coast. The value of property involved is given approximately at \$7,635,000. The property loss is estimated at \$1,254,000. Of the 4,618 persons aboard vessels in distress only twenty-five it is claimed, were lost, as against 680 last year. The value of the property lost decreased during the year nearly one-half. The total number of vessels lost was fifty-five, as against ninety-one last year.

As indicating the growth of the light-house service in this country, it may be noted that the total value of the property in charge of the institution is about \$100,000,000. Thirty-two steam tenders, six steam launches and two sailing tenders are employed in the construction and maintenance of aids to navigation. The greatest achievement of the service during the past year is the establishment of perfect telephonic connection between Scotland light-ship and the shore. This achievement of the light-house board seems to demonstrate that telephonic communication by means of simple appliances can be had with the shore by a vessel many miles at sea, without any direct metal connection nearer than several hundred feet from the vessel.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on June 29, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	17,365,000	4,603,000
Duluth	8,670,000
Milwaukee.....	267,000
Detroit.....	287,000	124,000
Toledo	301,000	216,000
Buffalo	930,000	556,000
Total.....	27,820,000	5,499,000

A trim little steam craft to be used for police patrol purposes at Buffalo, and known by the name Autralia, has just been sold to Buffalo's police department by the Marine Iron Works of Chicago. She is 50 feet over all, 10½ feet beam and of 40 inches draft, and is fitted with a triple expansion condensing engine having cylinder of 4½, 7 and 12 inches diameter by 12 inches stroke. The boiler is allowed 165 pounds steam pressure. The boat left Chicago July 3 for Buffalo, and will stop at several points including Milwaukee, Detroit and Cleveland on the way down.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE MARINE REVIEW, AND LOOK OVER THE SAILING DIRECTIONS OF LAKES SUPERIOR, HURON AND MICHIGAN, PUBLISHED BY THE HYDROGRAPHIC OFFICE.

Engines and Boilers of the St. Louis.

Although the American Line steamer St. Louis attained an average speed of only a little better than 18 knots on her first voyage across the Atlantic, with a maximum of $19\frac{1}{2}$ knots on 16,000 indicated horse power and 85 revolutions, it is well known that the engines were not pressed and that better speed is expected from the ship later on. Now that the St. Louis is in commission, her owners have, for the first time, given out a very full description of her machinery, which is here prefaced by dimensions of the vessel: Length over all, 554.2 feet; length between perpendiculars, 535.8 feet; extreme beam, 63 feet; gross tonnage, 11,629.21 tons; net tonnage, 5,893.73 tons.

The main engines are of the quadruple expansion type, but with six cylinders working on four cranks, an arrangement patented by Mr. John Thom, who is associated with the technical staff of the American line as a consulting engineer. There are two high pressure cylinders, and each of these is placed over one of the two low pressure cylinders. The tandem cylinders are at the forward end, the arrangement being high pressure and low pressure working on the first crank, the same working on the second crank, the second intermediate on the third crank and the first intermediate on the fourth crank. Steam, of course, is passed from the two high pressure cylinders into the one first intermediate, then to the second intermediate, and thence into the two low pressure cylinders. The diameters of the respective cylinders are: Two high pressure $28\frac{1}{2}$ inches, first intermediate 55 inches, second intermediate 77 inches, two low pressure 77 inches. The stroke in each case is five feet. The cylinders are each separate castings, and are supported on A-frames at back and front, the condenser and its pumps being separate and placed in the wings of the ship. The supporting frames are cast in two parts, each part having three sides only, with flanges to the outside for bolting together. The inside is thus entirely open, so that the soundness of the casting is apparent. The cylinders are braced longitudinally by cast iron girders of box section, which also extend between the forward and aft cylinder and the ship's bulkhead, so that there is little tendency to work. These bulkheads are specially stiffened by girders 2 feet deep, built of plates and angle bars. Each high pressure cylinder is carried 24 inches above the low pressure cylinder on cast iron frames on either side, and this clearance enables a manhole to be provided on the top of the low pressure cylinder to admit of examination, etc. The main stop valve is in the engine room, on the same level as the high pressure cylinders, and the inlet to the high pressure cylinder valves is controlled by a balanced piston throttle valve on the main pipe. The steam pipes are all of steel, lap-welded, with double riveted flanges, and the largest is 20 inches in diameter.

Piston valves of the Thom's balanced type are fitted throughout, and they are operated by the usual double eccentric link motion, the bent rod being for the astern motion. Eccentric straps are of cast steel filled with Parson's white metal. There are two valves for the low pressure cylinders. Frequently the guide brackets for the crosshead for valve spindles in such cases are insufficient, and the little slackness resulting tends to twist either spindle and snap it. In this case the guides have been brought out on either side to within 10 inches of the valve spindles. Cast brass guide blocks are fitted to the quadrant piece, the guides consisting of a cast steel bracket bolted to the low pressure cylinder. Special arrangements have been made for adjusting any wear. The spindle of the high pressure cylinder valve is worked from the low pressure valve crosshead through a bellcrank lever.

Cylinders are of cast iron. The second intermediate and the two low pressure cylinders only have jackets, and these drain into water taps which discharge into the hot-well tank. Outside all the cylinders are coated with asbestos, hair felt, and covered with sheet steel. The piston rods of the high pressure cylinders are 6 inches in diameter, and in the other cylinders $8\frac{1}{2}$ inches. The connecting rod is fully twice the length of stroke, 11 feet 3 inches centers, and it is $8\frac{1}{2}$ inches in diameter at top and 10 inches at bottom. The connecting rod at top is not forged with the usual U-end for the crosshead pins. The crosshead connection is built up. The top of the rod is squared to a T-piece, with a hole bored through the two heads. On the bottom of the crosshead itself, at either side, there is forged a projection, which is screwed and passed through the holes and bolted. In other words, the crosshead brasses have a steel T-piece with pin forged to the bottom which passes through the holes on the top of the connecting rod. Slipper guides for the crosshead are fitted to one side of the framing. There is a steel flange fitted on either side of the column face, and the slipper works inside it. Between the back of the crosshead and the other frame there is a small gangway to admit of inspection, and to economise weight a hole is bored through the crosshead brasses, which also have the usual piece for adjustment. Lubrication is from a separate tank at the top of the engine skylight, whither the oil is pumped from a supply tank, and whence it passes by gravitation in a series of pipes to the different parts of the engines, the supply being controlled at each delivery by a needle pointed valve.

The crank shaft is 21 inches in diameter and the crank pins 22 inches, the bolts being 5 inches at the bottom of the thread. The cranks themselves are 16 inches broad, the length of pin being $31\frac{1}{2}$ inches, and there is a 6-inch hole through the cranks and pins. The bearings are 26 inches long, and are of cast steel filled with Parson's metal. They are bolted down with $4\frac{1}{2}$ -inch bolts, and in the bottom water is circulated. The bedplate is of cast iron box section, 3 feet 4 inches deep and 4 feet 7 inches at the center, the center part, instead of being flat, being dished to the extent of 1 foot. The bases of the standards are fitted to the dished part of the bedplate as well as the flat portion, so as to tend to obviate the radical "working" which sets up torsional vibration and strains.

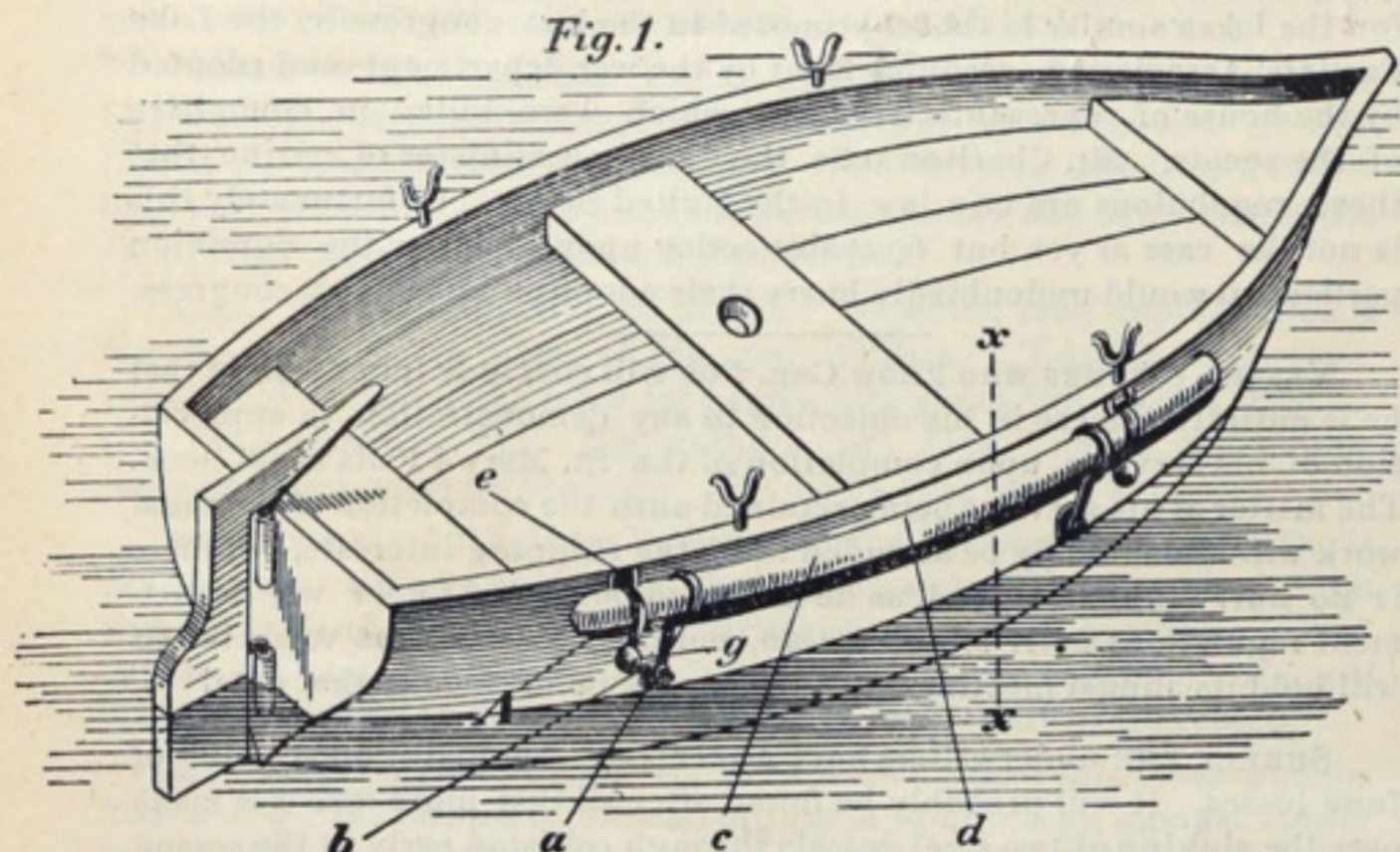
The thrust shaft is 21 inches in diameter, and solid, the diameter over thrust rings being 33 inches. The length of the thrust shaft is 14 feet, and it is secured to the bedplate of the engines. The propeller or line shaft is 19 inches in diameter, also solid. It is fitted in lengths of 23 feet, with bearings 14 feet apart. There is no outboard shaft, the framing and plating of the ship being bossed out in the same way as in most high-speed twin-screw merchant steamers now. The stern shaft, which is 21 inches in diameter, is covered with a liner $1\frac{1}{2}$ inches, working in lignum-vitæ bearings, constructed in the old style in strips $3\frac{1}{2}$ inches broad and 1 inch deep, the division between the strips allowing the water to circulate. The bosses of the propellers are of steel, with three blades of Parson's bronze, and these, for the present, are set at a pitch of $27\frac{1}{2}$ feet.

The condensers, separate from the main engines, are 7 feet 2 inches inside diameter, and the tubes, which are of seamless brass, are $\frac{3}{4}$ inch in diameter and 16 feet $8\frac{3}{8}$ inches long. The total condensing surface is 26,170 square feet. The air pumps are also placed in the wings of the ship. There are four for each condenser, and they are of the Worthington type, with steam cylinders 26 inches in diameter and 20 inches stroke. There are 8-inch valves to each of the four buckets. On the first voyage these worked at about twenty double strokes per minute, giving a vacuum of $26\frac{1}{2}$ inches. The air pumps discharge into the hot-well tank, which also receives the drainage from all the water traps in connection with the jacket of the cylinders, and with all the auxiliary machinery, and all is subsequently passed into the feed. The centrifugal pumps for the condenser are also of the Worthington type. They are driven by engines with 12-inch cylinders by 14 inches stroke. The discs are 3 feet 6 inches in diameter, with a $6\frac{1}{2}$ -inch inlet and $3\frac{3}{4}$ -inch discharge. The water, after it has been used for condensing, instead of being run overboard, is forced up to a tank on the topmost or boat deck, where, at a temperature of 115 degrees, it is stored in a tank available for use in baths or for galley or pantry use. The feed water is passed through Worthington's feed heater, being raised to 210 degrees, while the same company's vertical feed pumps are in use. The evaporator and distiller are on Quiggan's system, while the installation of general pumps for sanitary duty, for the hot sea water to baths, and for bilge duty, is on the Worthington system; and here it may be stated that all the auxiliary machinery exhausts into a separate condenser.

There are six double-ended and four single-ended boilers, each 15 feet $7\frac{1}{2}$ inches in diameter, while the former are 20 feet long, and the latter are 10 feet $4\frac{1}{2}$ inches. The shellplates are $1\frac{1}{16}$ inches in thickness, and are quadruple-riveted with $1\frac{1}{2}$ -inch rivets. The front plate is flanged inwards. All work at 200 pounds pressure, having been tested to 300 pounds water pressure. There are four furnaces in each end, and these have each separate combustion chambers. Thus there are in all sixty-four furnaces. These are of Fox's corrugated type, and in accordance with latest practice they are slightly reduced in diameter towards the back, so that they may be readily withdrawn for repairs without injuring the front of the boiler. The flues are 3 feet 3 inches in diameter, of $\frac{1}{2}$ inch thickness of metal, and the furnaces which have ordinary fire bars, are 6 feet $10\frac{1}{2}$ inches long. There are 416 tubes in the single-ended, and 832 in the double-ended boilers, the total number of tubes in all boilers being 6,656. The number of stay tubes is 328 in each double-ended boiler. The fire tubes are $2\frac{3}{4}$ inches in external diameter, and the thickness of metal 11 B. W. G., while the stay tubes are $2\frac{3}{4}$ inches in diameter and $\frac{1}{4}$ inch thick, the distance between tube sheets being 7 feet. The tubes are fitted with spiral retarders, which have given good results in causing the hot gases to pass in a helical course through the tubes, and thus insure prolonged contact with the surface. The tube plates are $\frac{5}{8}$ inch thick. The diameter of the combustion chamber stays at the smallest base is $1\frac{3}{4}$ inches for the outside row, and $1\frac{3}{8}$ inches for the inside row, by 7 inches pitch. The total grate area is 1,144 square feet, and the total heating surface 40,320 square feet. There are six safety valves on the double-ended and four on the single-ended boilers, all 4 inches in diameter. The installation of boilers is equally divided between two water tight compartments. There are thus three double-ended and two single-ended boilers in each, and the installation is worked under Howden's system of forced draught, by which the air is heated before being passed into the furnace. There is bunker capacity for carrying 2,500 tons of coal, which will just equal eight days consumption.

Another Unsinkable Boat.

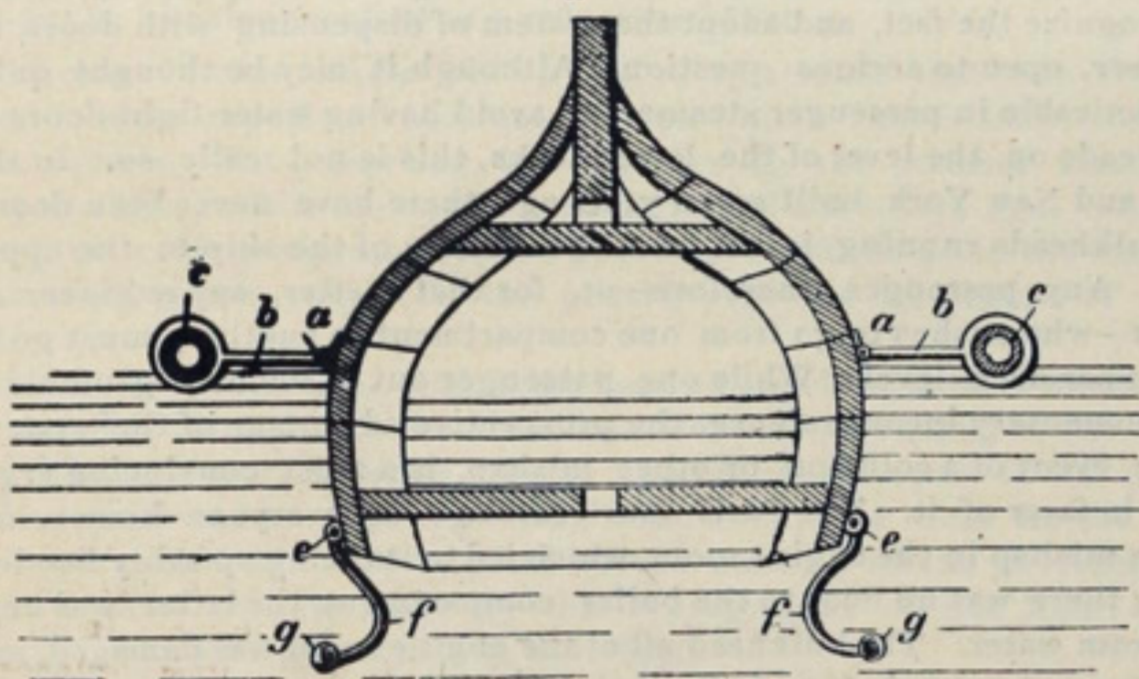
A German engineer, Waldemar von Ruedinger, has invented an arrangement of floating tubes, with a view to prevent small boats from sinking. The apparatus is described in the latest collection of consular reports. The tubes are intended to be employed in a manner similar to that of a life preserver and fulfill this intention by keeping even a capsized boat afloat, so that persons in the water can support themselves by



simply taking hold of the tubes. The contrivance can be attached to all boats of lesser dimensions, such as life boats, skiffs, gondolas, canoes, etc., without in the least interfering with their locomotion. Unless a boat is made to sink by overloading it, the floating tubes, it is claimed, prevent the possibility of its filling with water. Whereas, until now, persons who had fallen into the water were unable to rescue themselves by means of a capsized boat, the latter, when supplied with the floating tubes, furnishes an excellent means of support. Fig. 1 shows the floating tubes attached to a skiff. Fig. 2 represents a cross section of the same boat when capsized and sustained by the tubes.

On both sides of the boat are attached two steel eyes *a*, over which bands *b* operate and sustain the watertight tubes *c*. The latter are furnished with an arrangement to admit air and are so attached that their

Fig. 2.



center line corresponds with that of the boat. For the purpose of holding the tubes in place, bands of oval shape working in eyes and weighted at the free end *g* are attached to the boat's outer planks. By reason of this arrangement of the various parts, the capsizing of a boat becomes, it is claimed, almost a matter of impossibility. Should this occur, however, because of oversight, the weighted bands turn on their eyes, simply swing down and free the tubes. The latter, in their turn, being filled with air, also move, but in the opposite direction and float on the surface of the water. At the same time, watertight rings of similar construction as the tubes would turn on ball joints, and, together with the tubes, keep the boat afloat. Then all the shipwrecked persons need do would be to take firm hold of either rings or tubes.

Trustees of the Chicago drainage canal claim they could finish the entire work in a year if they had the means. Of the entire excavation 57.3 per cent had been finished up to June 1. The amount of work done in May was considerably in excess of any previous month, amounting in value to a little over \$675,000.

The Nickel Plate road has compiled a list of country homes along the south shore of Lake Erie, willing to accommodate summer boarders, and a copy will be mailed to any address by enclosing a stamp to any agent of the Nickel Plate road, or to B. F. Horner, general passenger agent. Aug. 31—265

In General.

"The Rigger's Guide and Seaman's Assistant" is the title of a handy book published by Griffin & Co., Portsmouth, England. Its chief value to lake ship builders and seaman is the space devoted to wire rope rigging. It contains 250 pages and can be ordered through the MARINE REVIEW for \$1.50, postage paid.

Carrier pigeons will be experimented with by the navy with a view to their adoption in the service. Secretary Herbert has under consideration the advisability of requesting congress to make a small appropriation for the purchase of these birds. Some few experiments have already been made with the pigeons with satisfactory results.

Directors of the Bethlehem Iron Company of South Bethlehem, Pa., elected at the annual meeting of the stockholders a few days ago, are: R. H. Sayre of South Bethlehem, Jos. Wharton of Philadelphia, E. P. Wilbur of South Bethlehem, R. P. Linderman of South Bethlehem, George H. Myers of Bethlehem, Beauveau Borie of Philadelphia and J. Bertram Lippincott of Philadelphia.

Capt. Sumner, who is in command of the U. S. cruiser Columbia, sister ship of the Minneapolis, which is the fastest big war ship afloat, has been ordered by Secretary Herbert to push his ship on her return voyage from the naval display at Kiel. Only natural draught will, of course, be used. The Columbia will not wait for the cruiser New York, but as soon as her coal bunkers are filled, she will start on her homeward voyage. The Columbia made on her official trial a speed of 22.8 knots per hour. This was under forced draught. It is thought by some of the enthusiastic admirers of the triple-screw cruiser that she will make a speed of between 18 and 19 knots, at least.

In addition to the forty-two torpedo boat destroyers, which have been in course of construction during the past two years, each having a speed of 27 knots, the British admiralty has decided to order twenty more of a similar type, the conditions of contract being, however, that they are to attain a mean speed of 30 knots during a continuous three hours' official trial. They are all to be built by contract, and the armament of each vessel will consist of one 12-pounder and five 6-pounder quick firing guns, being two 6-pounders more than are carried in the Havock type of torpedo boat destroyer. The vessels, which are not yet named, are officially designated 30-knot torpedo boat destroyers and will cost about \$250,000 each.

Keels for four new Russian war vessels were laid recently at the admiralty yards in St. Petersburg with great ceremony, the czar and several members of the royal family being present. The dimensions of the new ships will be as follows: The Russia, triple screws, length 473 feet; beam, 68 feet; mean draft, 26 feet; displacement, 12,200 tons; engines, 17,000 indicated horse power. The Apraksin, length, 277 feet; beam, 52 feet; draft, 17 feet; displacement, 4,126 tons; engines, 5,000 indicated horse power. The Khrabry, length, 229 feet; beam, 41 feet; displacement, 1,492 tons; engines, 2,000 indicated horse power. The Vierny, length, 203 feet; beam 36 feet; displacement, 1,280 tons; auxiliary steam, 400 indicated horse power.

Several small vessels owned on the lakes were registered by the bureau of navigation, treasury department, last week. The list follows: Steam—Colonial, Buffalo, N. Y., 110.32 tons gross, 80.15 net, No. 127,089; Cascade, Buffalo, N. Y., 72.84 tons gross, 49.59 net, No. 127,088; Wapita, Port Huron, Mich., 83.82 tons gross, 57.00 net, No. 81,507; Adventurer, Duluth, Minn., 16.32 tons gross, 8.40 net, No. 107,174; Florence, Cleveland, O., 9.54 tons gross, 6.49 net, No. 120,996. Sail and unriggered—J. B. Noyes, Duluth, Minn., 386.78 tons gross, same net, No. 46,462; Mary L., Grand Haven, Mich., 27.80 tons gross, 26.41 net, No. 92,661; Lulu Guy, Grand Haven, Mich., 14.68 tons gross, 13.95 net, No. 141,381; Birdie, Grand Haven, Mich., 11.93 tons gross, 11.33 net, No. 3,650.

The Nickel Plate road has published a map of Boston, Mass., showing the location of the Christian Endeavor convention hall and state headquarters of the 14th international convention, July 10th to 15th, and presenting the merits of the company's through drawing room sleeping car line between Chicago and Boston. Write for a copy to any agent of the Nickel Plate road, or B. F. Horner, general passenger agent. July 5—266

THREE BOOKS OF SAILING DIRECTIONS, ONE COVERING LAKE SUPERIOR AND THE ST. MARY'S RIVER, ANOTHER COVERING LAKE MICHIGAN AND THE STRAITS OF MACKINAC, AND A THIRD TAKING IN LAKES HURON AND ST. CLAIR WITH DETROIT AND ST. CLAIR RIVERS, ARE NOW OFFERED FOR SALE BY THE HYDROGRAPHIC OFFICE. THESE BOOKS ARE PARTS OF A WORK THAT WILL COVER THE ENTIRE CHAIN OF LAKES. THEY CONTAIN CHARTS OF LEADING CHANNELS AND HARBORS, AND MAY BE HAD FROM THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, AT \$1 EACH.

A CHART COVERING LAKE HURON, GEORGIAN BAY AND THE STRAITS OF MACKINAC, ALL ON ONE SHEET, HAS BEEN ISSUED BY THE HYDROGRAPHIC OFFICE AND MAY BE HAD FROM THE MARINE REVIEW AT 75 CENTS. LAKE SUPERIOR ON ONE SHEET IS ALSO IN PRINT AND SELLS AT THE SAME PRICE.



DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,731	843,239.65
Sailing vessels.....	1,139	302,985.31
Canal boats.....	386	41,961.25
Barges.....	85	39,214.51
Total.....	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30,	Number.	Net Tonnage.
1890.....	218	108,515.00
" " " 1891.....	204	111,856.45
" " " 1892.....	169	45,168.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
Total.....	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.
(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

VESSELS aggregating about 580,000 registered tons are now listed on the books of the Lake Carriers' Association, and the officers of the organization are making a strong effort to reach the 600,000-ton mark. A few owners who have thus far remained out of the association on the claim that they derive no direct benefit from it are hardly acting in justice to their associates in the lake business, many of whom have reason to set up a similar claim but have not done so. The work of the association aside from its shipping offices has been of a kind that can only be accomplished through united action. Reductions in freight handling charges, which were absolutely necessary on account of business conditions, and which were secured through the efforts of the association during the past two years, have been alone sufficient to demand for the organization the support of all vessel interests.

LATEST advices received at Washington from Col. Wm. Ludlow, chairman of the Nicaraguan canal commission, indicate that the commission has concluded its examination of the line of the canal. Climatic conditions did not interfere with the work of the commission, and the Nicaraguan government extended to it every attention and courtesy. Before returning to the United States, however, the commission intends to make a journey across the Isthmus of Panama, in order to make an inspection of the incomplete Panama canal. The commission was ready to start for Panama early last week. The impression seems to be that the commission's examination of the Nicaragua route has been satisfactory, though for any detailed statement of its conclusions it will be necessary to wait until its return, which will be immediately after its inspection of the Panama canal.

CLEVELAND and other lake cities that propose to take immediate action in the matter of preparing their harbors for increased shipping, resulting from the 20-foot channel improvement, will certainly profit by any investments that may be made in this regard. Older cities on the Atlantic coast are constantly spending large sums of money on their harbors. The city of Philadelphia is now projecting some improvements in the harbor on the Delaware river, which will include among other features the construction of four piers of sufficient size to accommodate

the largest ocean going steamers and ranging in width from 80 to 100 feet. Boston also is contemplating some extensive improvements in the docks in that city, to accomplish which from \$10,000,000 to \$15,000,000 will be required.

JOHN CHARLTON, a leading owner of Canadian vessels on the lakes, has taken up with Hon. John Costigan, Canadian minister of marine, the question of the dominion government adopting raft towing regulations for the lakes similar to those proposed in the last congress by the Lake Carriers' Association, recommended by the war department and adopted by the house of representatives, but which were killed in committee of the senate. Mr. Charlton tells the Canadian minister of marine that these regulations are now law in the United States. Unfortunately this is not the case as yet, but favorable action upon them by the dominion parliament would undoubtedly hurry their adoption by our own congress.

VESSEL OWNERS who know Gen. Poe will conclude immediately that he is entirely sincere in his objection to any demonstration in appreciation of his services upon completion of the St. Mary's Falls canal lock. The matter of his services being retained until the completion of the canal work will undoubtedly be attended to by the shipping interests, but there is no hurry in that regard, as he is not to be retired under war department regulations until March 7, 1896, and the Lake Carriers' Association will hold its annual meeting full two months in advance of that date.

SURELY THE underwriters have no cause for complaint on account of June losses. It will probably be found after all that more fuss was made over the sinking of two steel vessels through collision early in the season than was really warranted.

LET THE celebration of the Glorious Fourth be the most remarkable in the history of the day. Fireworks and festivities will serve as a formal inauguration of the business revival after a long period of depression.

Doors or No Doors in Water Tight Bulkheads.

Since the memorable disaster which befell H. M. S. Victoria, and especially since the recent Elbe catastrophe, there has been a growing feeling amongst ship designers that doors and openings of any kind in watertight bulkheads should be altogether abolished. These deplorable events have emphasized the fact that in spite of the many ingenious methods of promptly closing doors, and rendering bulkheads water tight, panic and human error in critical emergencies are matters which come in to discount such efficiency. Whether it might be better at once fully to recognize the fact, and adopt the system of dispensing with doors, is, however, open to serious question. Although it may be thought quite impracticable in passenger steamers to avoid having water tight doors in bulkheads on the level of the lower decks, this is not really so. In the Paris and New York, built seven years ago, there have never been doors; the bulkheads running intact from the bottom of the ship to the upper deck. Any passenger, therefore—or, for that matter, any engineer or stoker—who wishes to go from one compartment to another, must go to the upper deck level. While one passenger out of 100 may grumble at the momentary inconvenience, the prospective advantage of the system, in the event of a collision or other mishap, is a most convincing argument in favor of it. The Paris four years ago, as everyone knows, met with a mishap in the engine room, which led to its being speedily flooded, but as there was no door to the boiler compartment, the latter was kept free from water. The bulkhead aft of the engine room was damaged, and the compartment abaft of it flooded, but still the vessel floated. This drastic way of cutting the Gordian knot of openings in watertight bulkheads does not seem altogether to commend itself to the United States naval authorities. Since the disaster to the Victoria, they have devoted much attention to the question of bulkheads. Chief Engineer Melville has now prepared several mechanical devices, which may be operated either by compressed air or by electricity, by means of which all the bulkhead doors of a vessel can be automatically closed at a moment's notice. The officer on deck or the man in the conning tower, on seeing danger, can, by simply pulling a lever, close every door instantaneously, after first, by prearrangement, whistle or bell signal, warning those below to hasten on deck or otherwise escape. The plan will be tested on board one of the new American warships, and the result, it is hoped, when known, will materially help to a settlement of the question of doors or no doors in bulkheads intended to be thoroughly water tight.—The Engineer, London.

For the National Educational Association at Denver, Col., July 5th to 12th, the Nickel Plate road offers special low rates. A superb passenger service. Unexcelled dining cars. For information inquire of agents of the Nickel Plate road.

282 July 4

GO TO THE SEA SHORE—July 8th to 13th and attend the meeting of the League of American Wheelmen at Asbury Park, N. J. The Nickel Plate road has authorized a rate of a fare and a third on the certificate plan.

278 July 4

Around the Lakes.

Revenue cutter officials have been doing some quiet work among lake vessels. Capt. James Davidson's steamer Robert Holland was a few days ago fined \$500 on account of failure in renewing license.

Only two new vessels, the steamers Rappahannock and Sacramento, built and owned by Capt. James Davidson of West Bay City, Mich., are given a rating in the July supplement to the Inland Lloyds Vessel Register. Both are of 1,911 net tons, \$145,000 valuation and A 1st rating.

Officers of the Canadian Pacific steamer Alberta inaugurated the boat's service between Windsor and Port Arthur with a modest celebration at the former port a few days ago. The Alberta, which is a Clyde-built boat, 270 feet long, will make stops at Mackinaw and Sault. Ste. Marie on all trips between Windsor and Port Arthur.

Capt. Thomas English, an old and respected lake captain died, a few days ago at the home of his son, William T. English of Detroit. Capt. English sailed the lakes for nearly fifty years, but retired from active life a few years ago. His brother, Capt. Alex. English of Chicago, was also well known on the lakes. He died a year or two ago.

Superintending Engineer D. Fraser of the Northern Steamship Co. is preparing for a series of tests on the big passenger steamers North West and North Land with a view to securing accurate data regarding speed, engine and boiler performance, etc., under various conditions. He will probably be assisted in the work by George C. Shepard of Cleveland.

A shortage is noted in reports of hard coal shipments from Buffalo. The total for the season to the end of June is 525,169 tons, against 728,407 tons on the same date last season. The June movement aggregated 285,381 tons, against 384,663 tons for June, 1894. Shipments of anthracite are also light from Erie and through the Welland canal—hardly more than a cargo a day in each case.

The new schooner built by Abram Smith & Son of Algonac, Mich., on speculation was successfully launched on Wednesday last. She was named A. W. Comstock, after Hon. A. W. Comstock of Detroit. She is 200 feet long on the keel, 36 feet beam and 12½ feet deep, has a steamer stern, carries three pole masts, steam windlass and winches and will have sails. She is a handsome, well-built boat.

W. H. Singer of Duluth seems to have entered the harbor towing business with a view to continuing in it, as he is endeavoring to increase his fleet of tugs, and his dealings with vessel owners and masters have been highly satisfactory. A little healthful competition was needed in harbor towing at Duluth and Superior. Competition at Buffalo and Tonawanda has also resulted in a reduction of rates.

Officers of steam vessels will do well to remember that they are required to make reports of accidents to the United States inspectors of steam vessels. W. J. Sterling, an engineer on the steamer Oscar T. Flint, was killed while the boat was in Cleveland a few days ago. No report of the accident was made to the government officials, and the master of the vessel is now subject to the penalty provided for neglect of this kind.

The U. S. S. Michigan, which has been engaged for several weeks on a survey of Cleveland harbor and the lake front in the vicinity of the city, has finished the work and has gone to Detroit, where a part of her crew will be transferred to shore quarters, in order to make room for the Detroit naval militia who will be given a little training on the government ship. A chart will be made by the hydrographic service from data secured by the Michigan while in Cleveland.

Paul Heubner's well-known egg-shaped life-boat has reached Milwaukee from Detroit, and her fortunes will be looked after by the Continental Lifeboat Co. of that city. She cost \$4,000 and will carry thirty-four people. Although she did not prove all that her inventor expected in trial trips at Detroit, yet he was satisfied that she will do the work he requires, and he has succeeded in convincing the company to the same effect. They will go ahead and build more of the boats.—Detroit Free Press.

Efforts to find the sunken steamer Cayuga, which went down in collision, several weeks ago, with the steamer Joseph L. Hurd near the Straits of Mackinaw, have finally been successful, and Capt. C. H. Sinclair, who represents Chicago underwriters, and who was instigative in locating the wreck, has wired his employers that there is 75 feet of water over her decks. Notwithstanding the great depth in which the steamer is sunk, an effort will very probably be made to raise her, as the boat was among the strongest and most valuable of steel craft on the lakes.

The light-house service has finally secured two gas buoys for the lakes and they have reached Erie, where they will be stationed under the direction of Commander Charles V. Gridley, inspector of the tenth light-house district. The bouys are of the Pintsch type, which have been described several times in the REVIEW. There are numerous places on the lakes where gas buoys might be used to great advantage, and it is to be hoped that experience with the two buoys at Erie will prompt the light-house board to furnish more of them for lake districts.

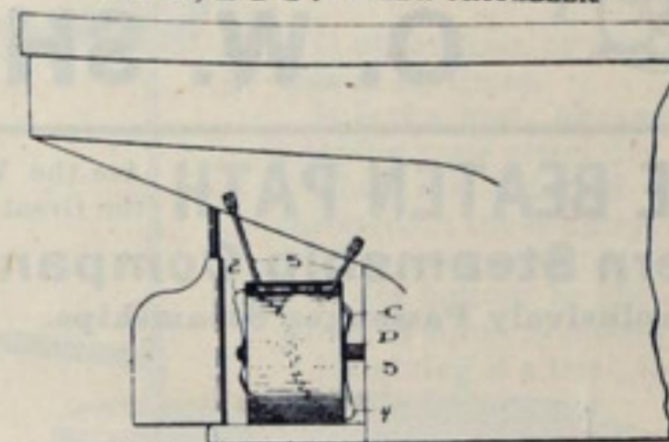
Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

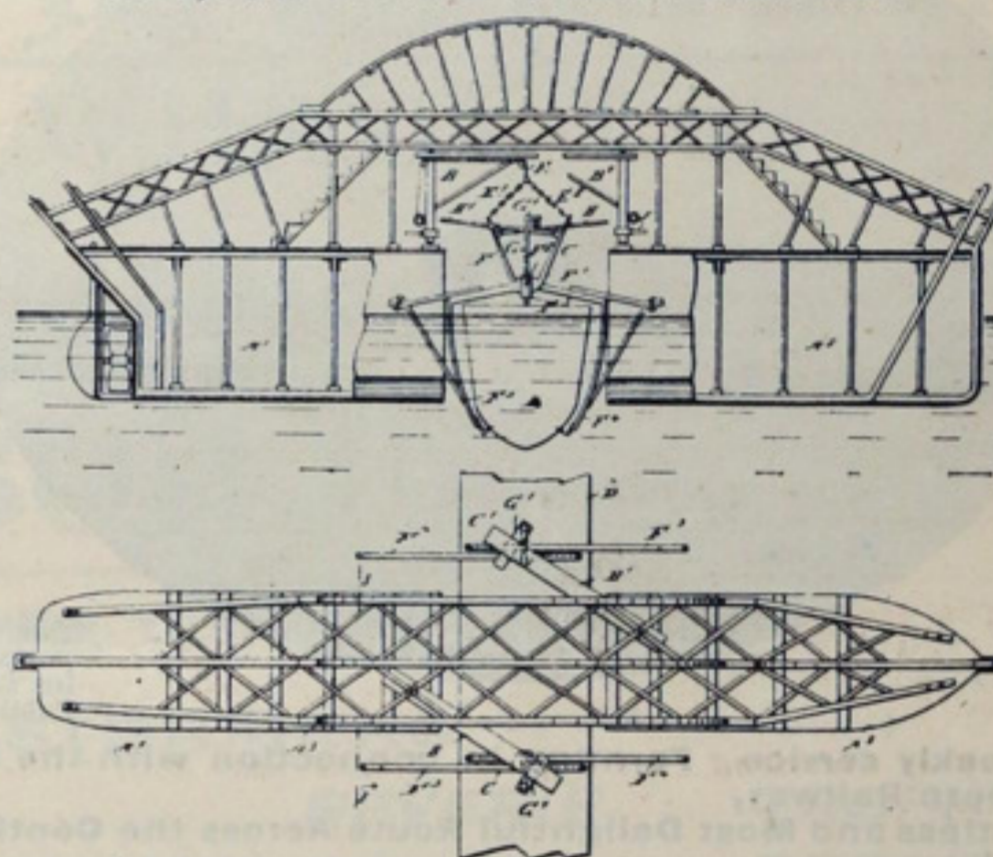
541,480. Screw Propeller. Melvin Gleason, Cleveland, Ohio, assignor of three-fourths to Henry Steinhauer, Christian Stocke and Theodore Wiebelt, same place. Filed Feb. 25, 1895. Serial No. 539,575.

Claim—The combination of the boat, the cylinder open at both ends and fixed rigidly to the stern thereof, the power shaft extending through said cylinder into the boat and two propeller blades on said shaft having the shape of the worm of an auger and both their ends projecting beyond the ends of the cylinder, whereby a dip of the blades is effected in the body of the water outside the cylinder whether the vessel is going backward or forward.

541,480. SCREW-PROPELLER



541,794. APPARATUS FOR RAISING SUNKEN VESSELS



541,794. Apparatus for Raising Sunken Vessels. Hubert Schon, Allegheney, Pa., assignor of three-fifths to Anton Lutz and George Muth, same place. Filed March 6, 1895. Serial No. 540,732.

Claim—An apparatus for raising sunken vessels, comprising a marine vessel having a two-part hull, with the parts placed a suitable distance apart and rigidly connected with each other overhead by a suitable framework, two cranes held in adjacent ends of the said hull parts, grappling devices held on the hoisting chains of the said cranes, a locking and tripping device for holding the grappling forks of the said grappling devices in an open position during the time the grappling devices are lowered, and for automatically releasing the grappling forks when striking a vessel, and an indicator for indicating the engagement of the grappling forks with a vessel.

Trade Notes.

E. T. Hitchcock and Daniel H. Wilcox of Buffalo announce the formation of the firm of Hitchcock & Wilcox, average adjusters and insurance and vessel brokers, with offices at 184 Main street.

Branch offices are now maintained by the Brown Hoisting & Conveying Machine Company of Cleveland in the Havemeyer building, New York, Marquette building in Chicago, and Carnegie building, Pittsburg.

The Marine Manufacturing & Supply Co. of 158 South street, New York, is sending out to patrons small packages of lead pencils of a very good quality. This method of advertising is probably expensive, but the new supply company has indicated from the start that its policy is not to do things by halves.

The J. H. Parsons Chemical Company is now the name of the Chicago company formerly known as the Parsons & Pattison Chemical Company. The headquarters of the company in the Masonic Temple building will not be changed. The Alkali water purifier manufactured by this concern is used extensively in boilers of steam vessels on the lakes.

REDUCED RATES TO ASBURY PARK.—The Nickel Plate road offers a rate of a fare and a third on the certificate plan July 8th to 13th, account national meeting League of American Wheelmen.

277 July 4



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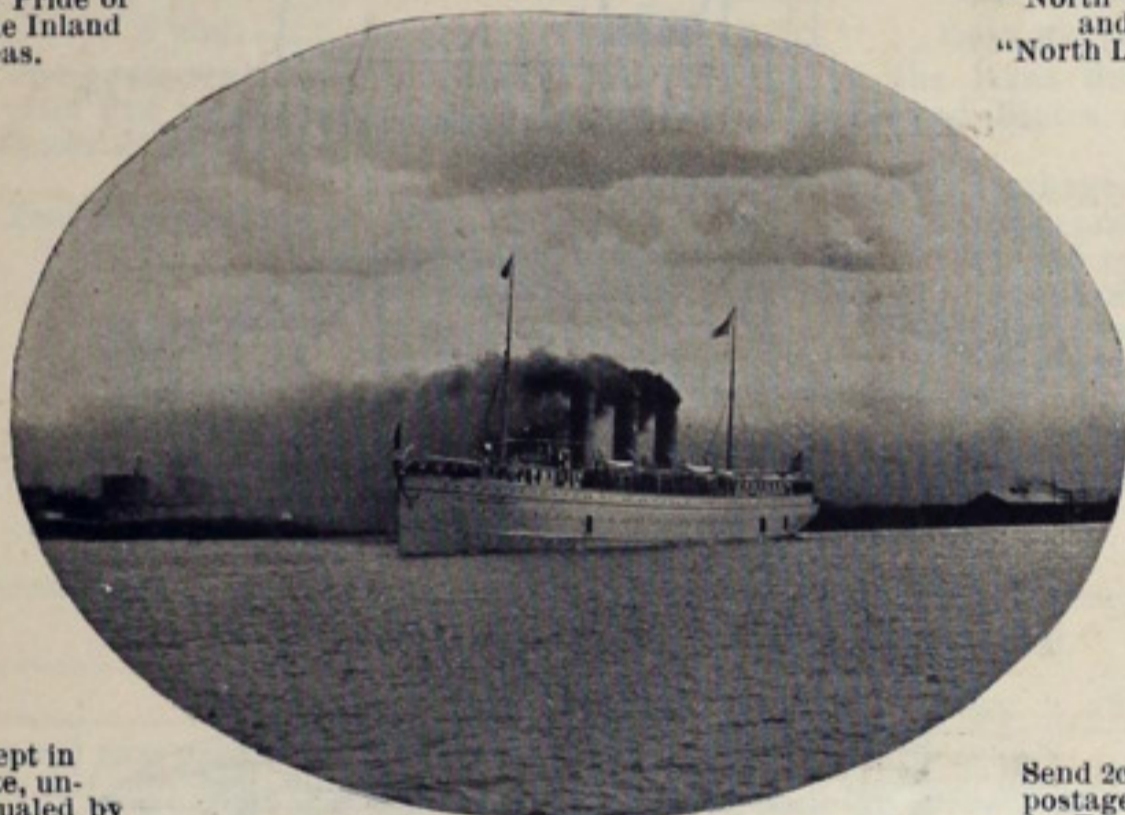
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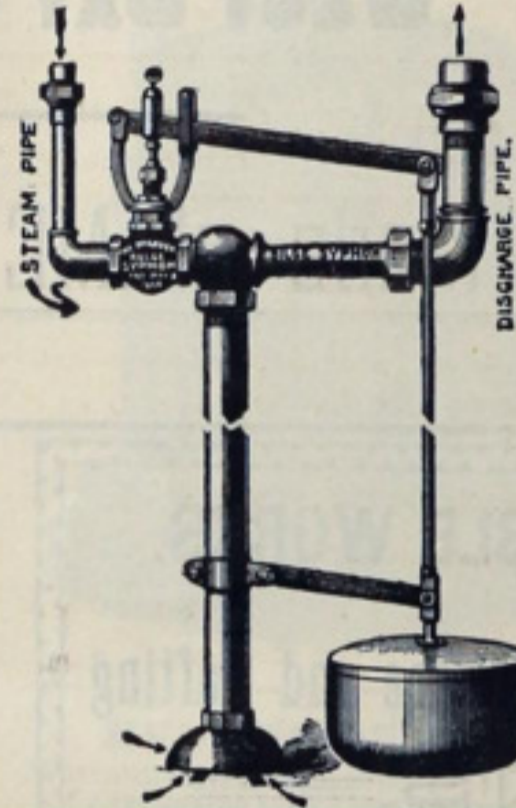
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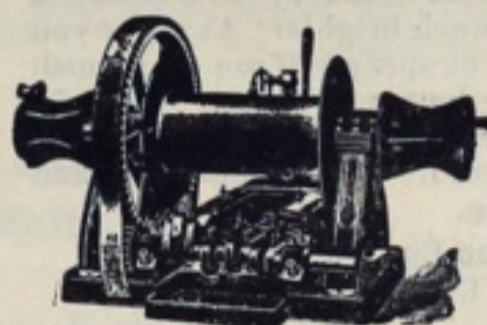
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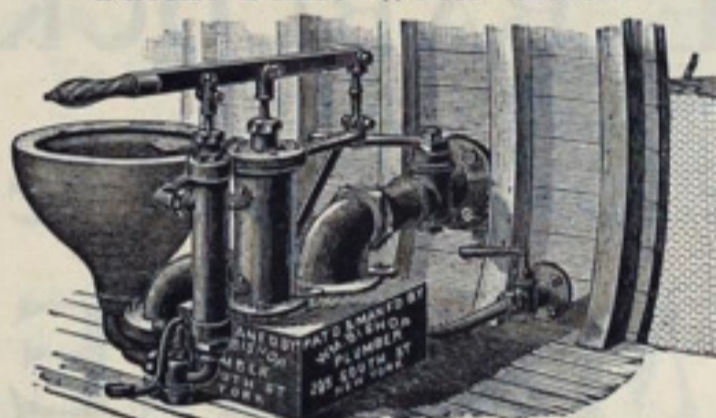
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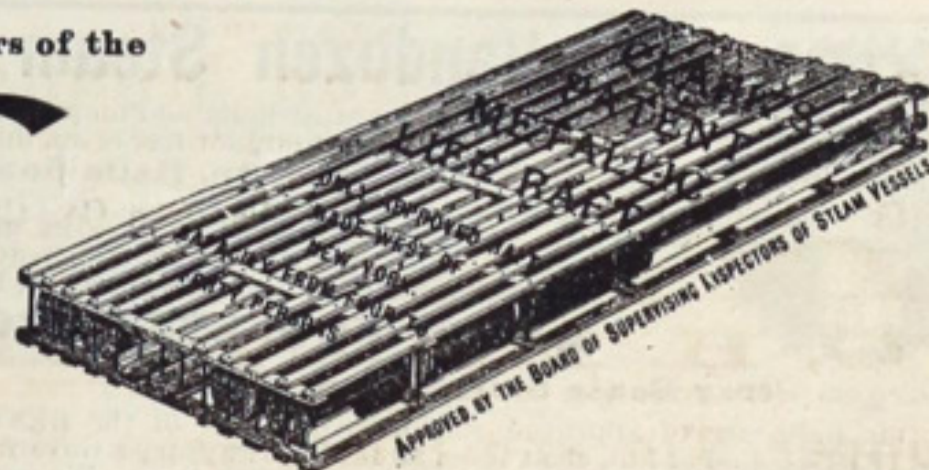
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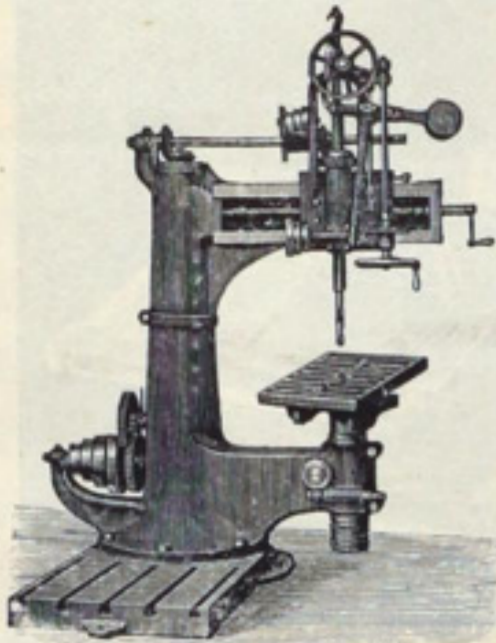
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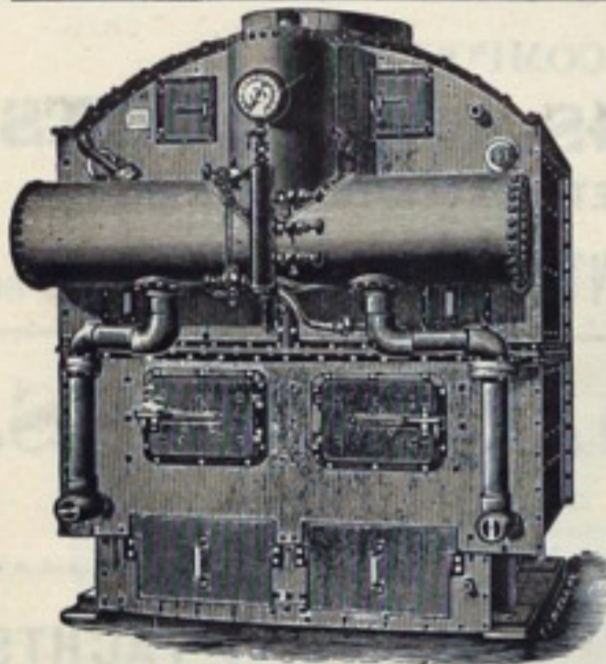
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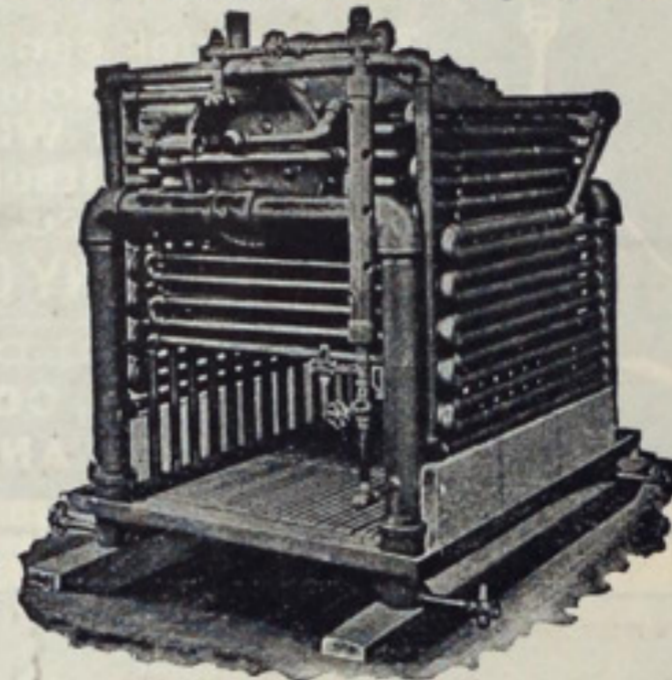
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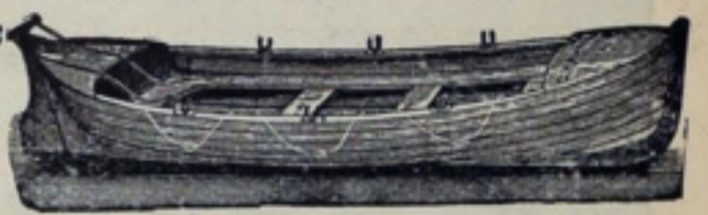
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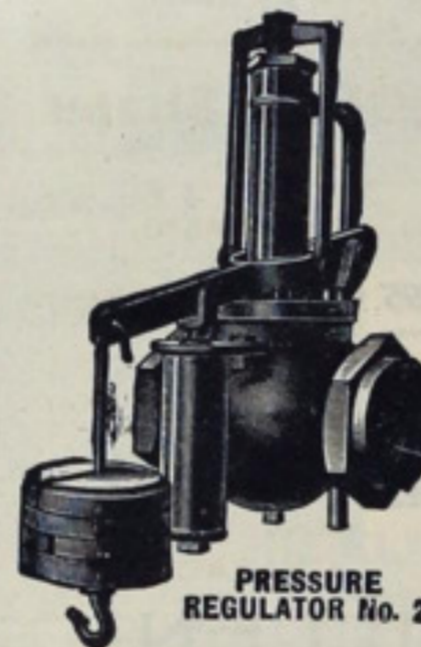
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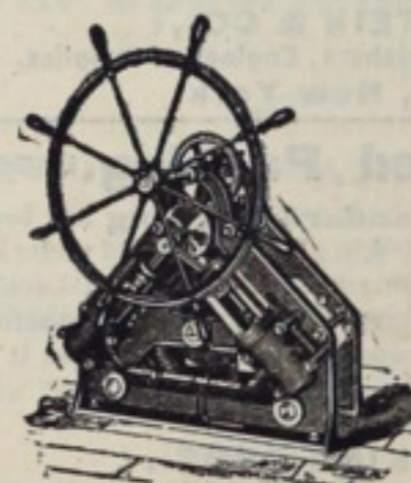
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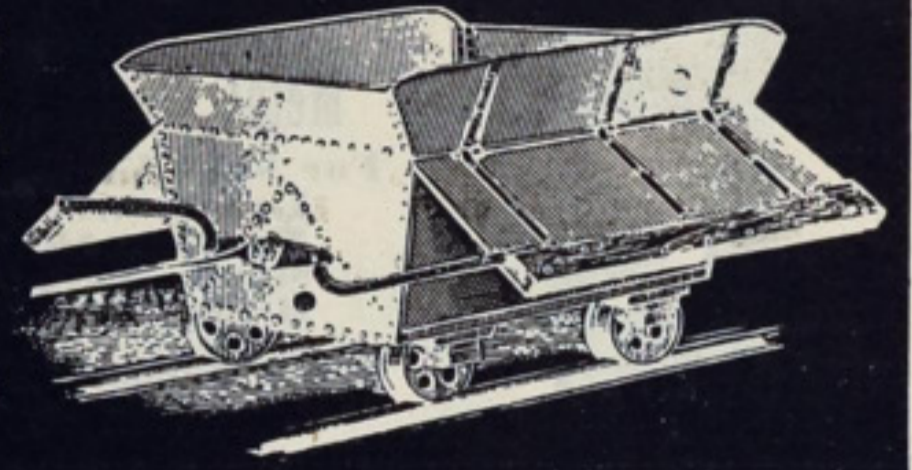
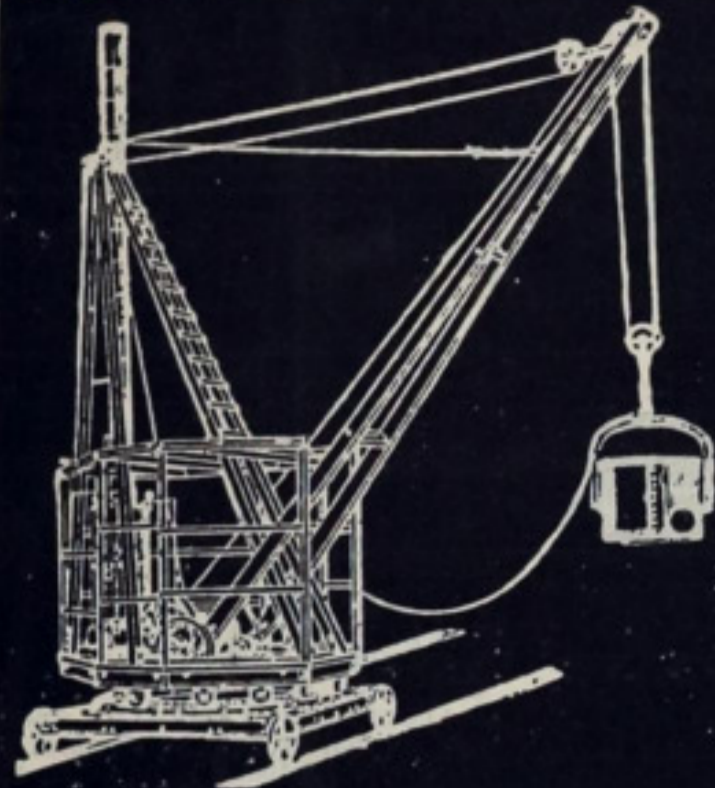
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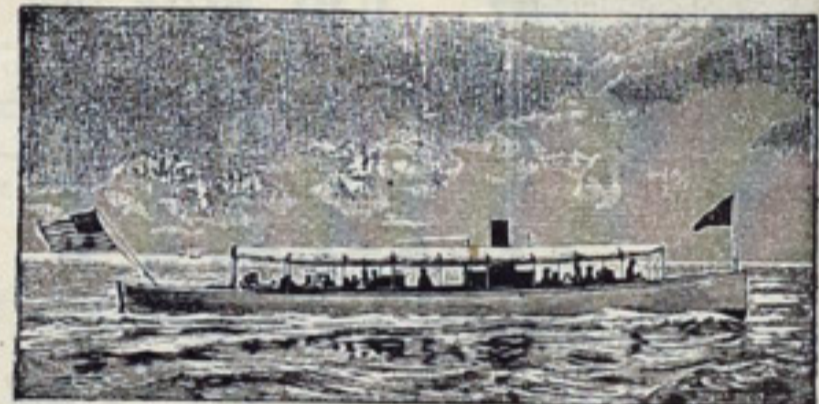
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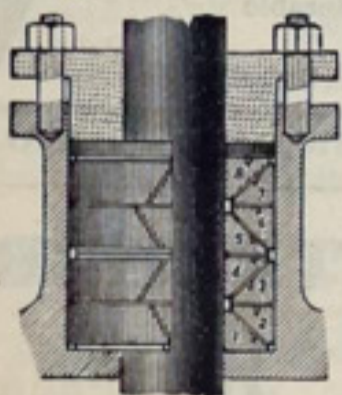
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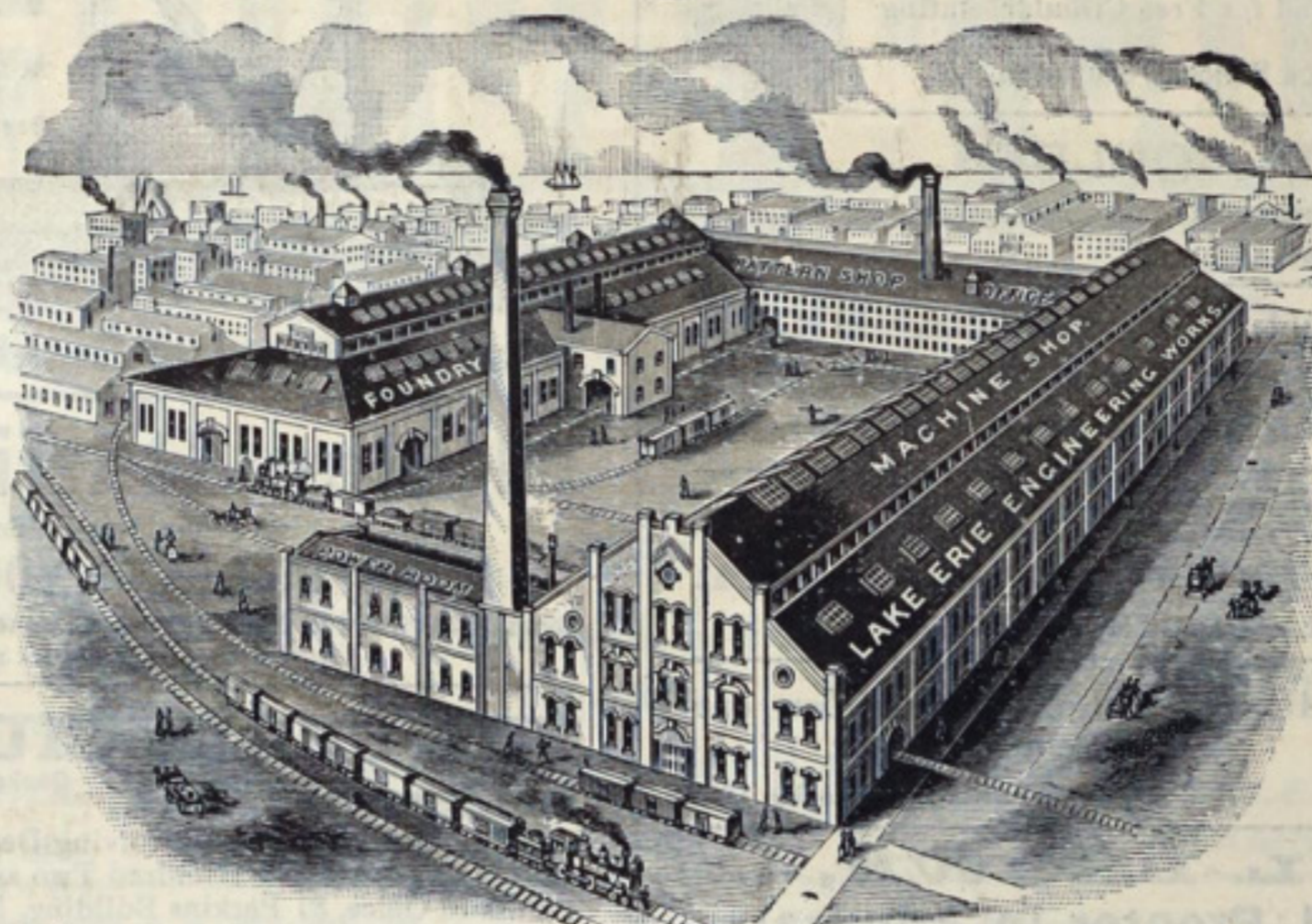
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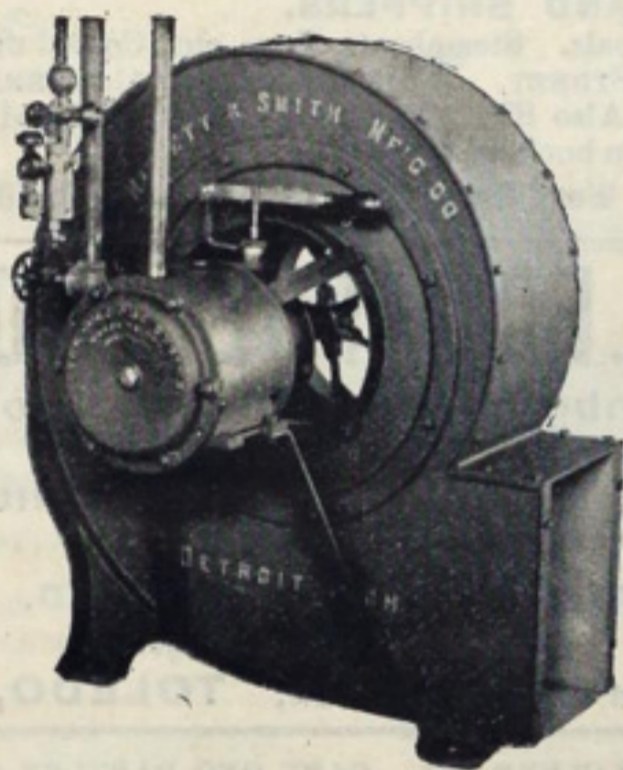
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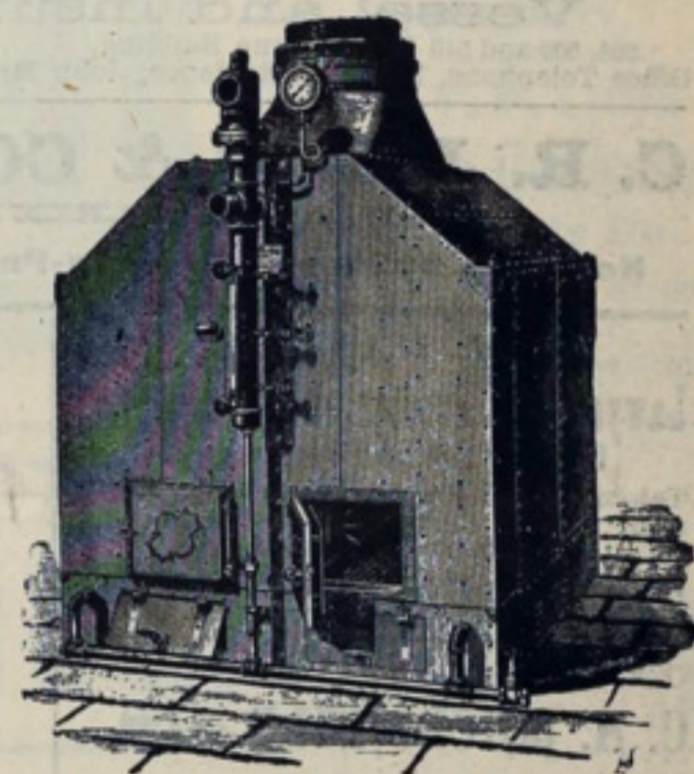
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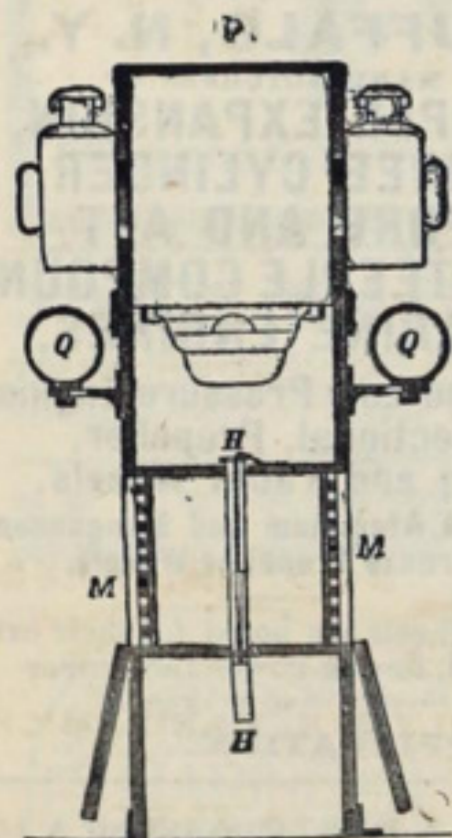


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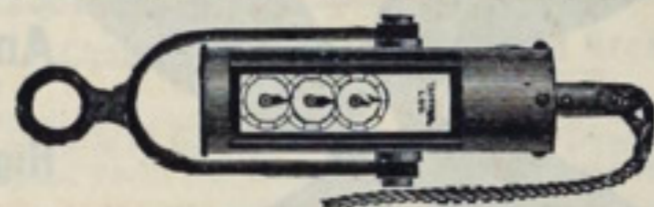
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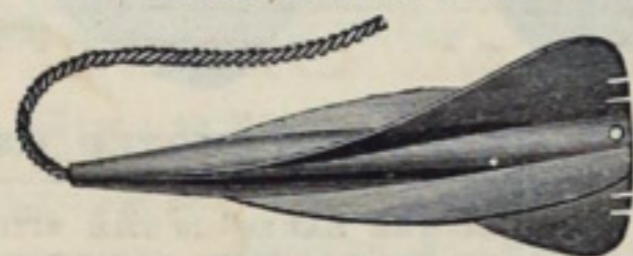


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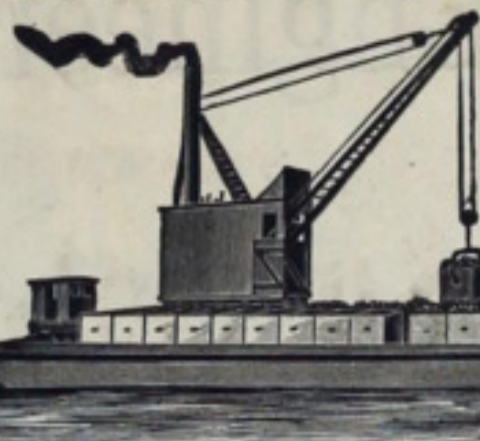


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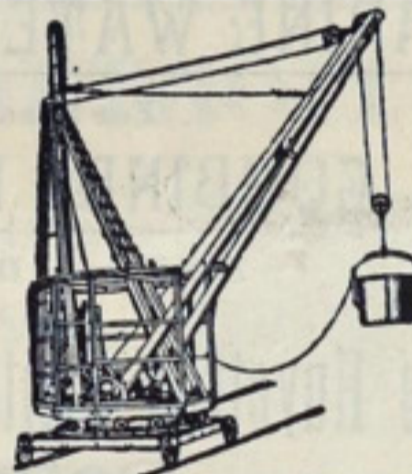
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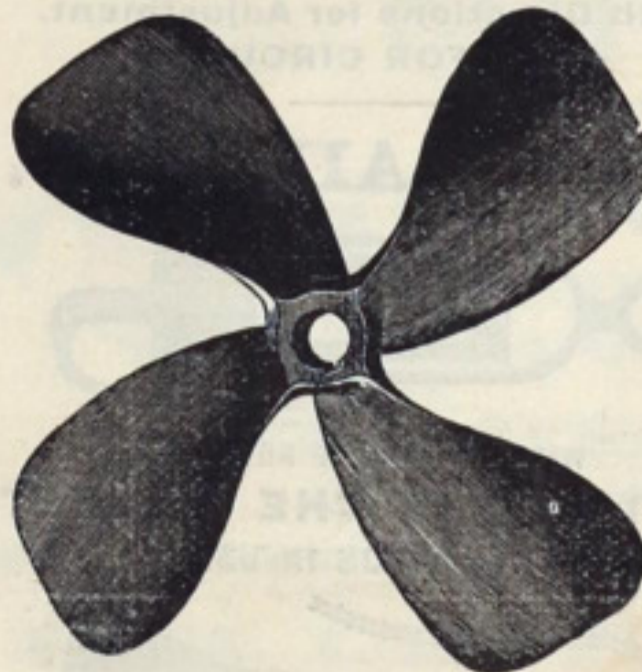
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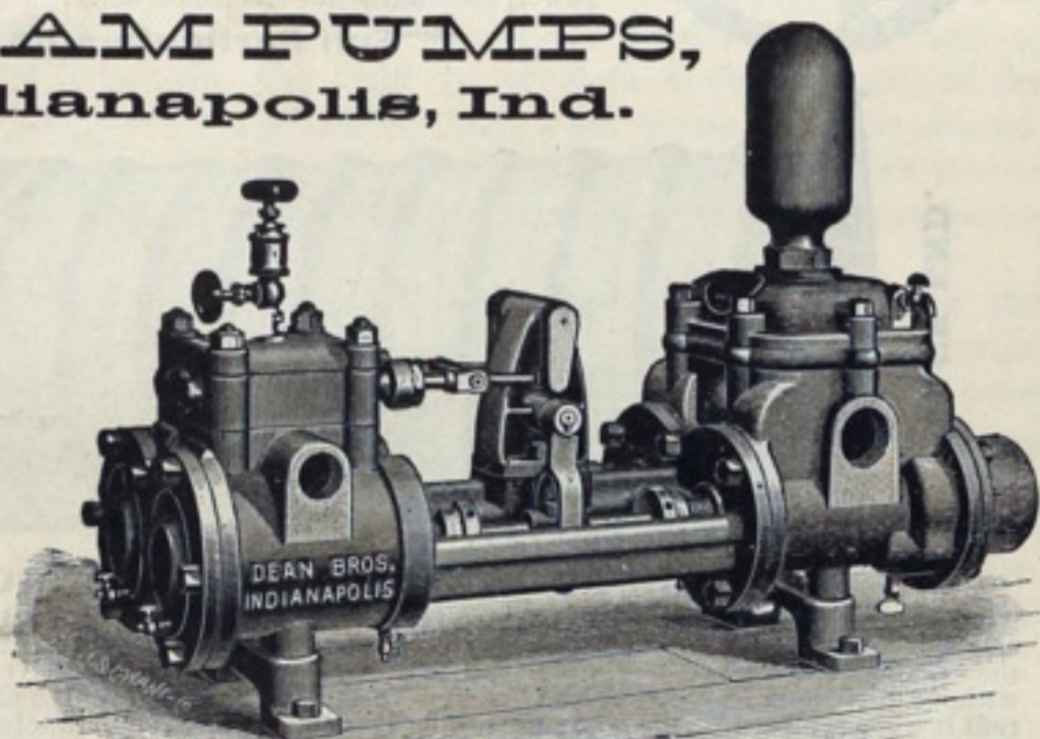
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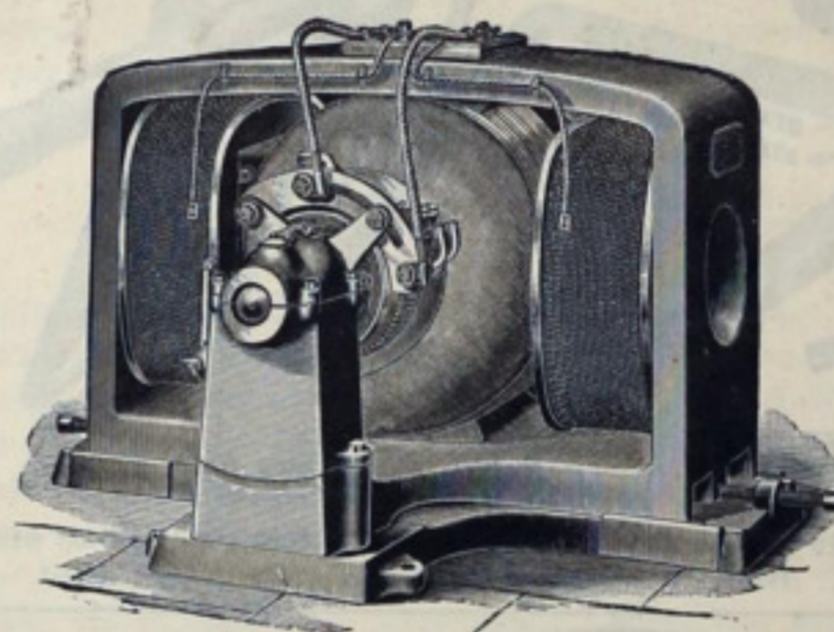
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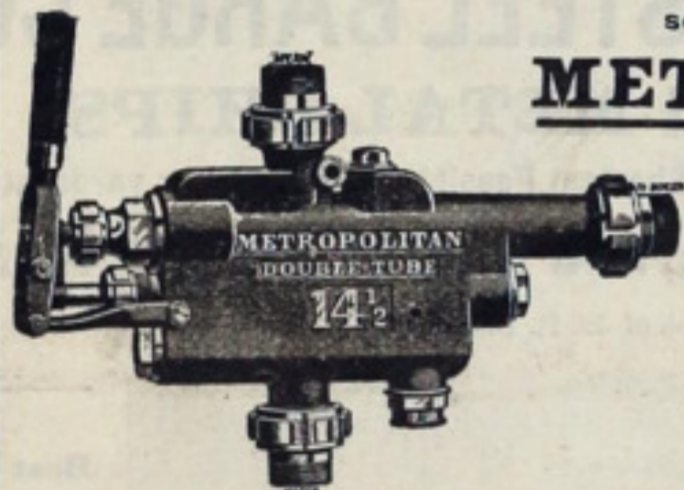
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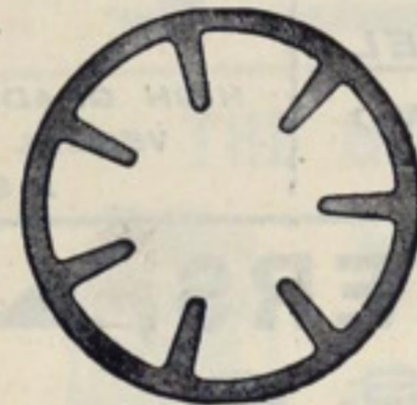
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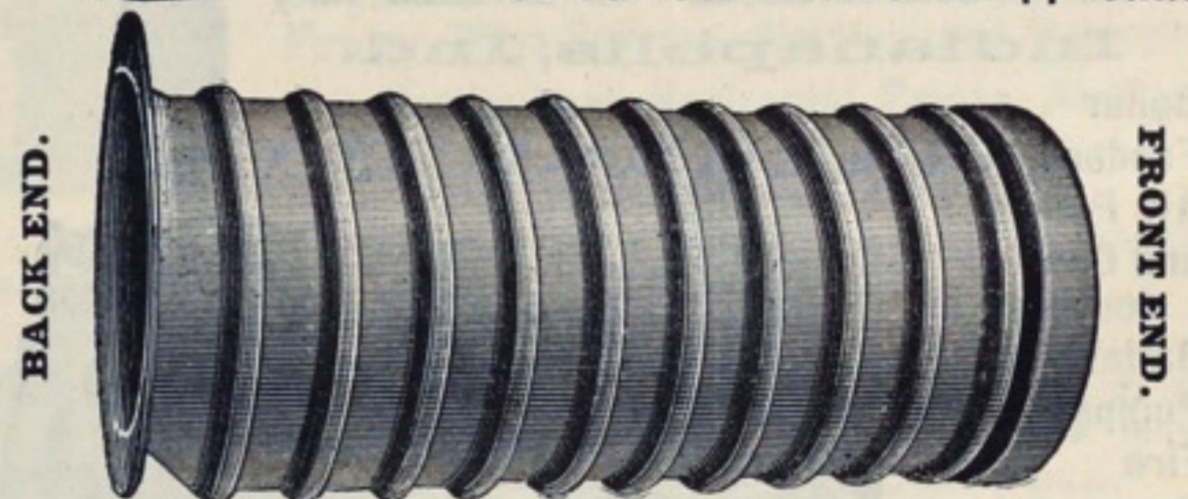
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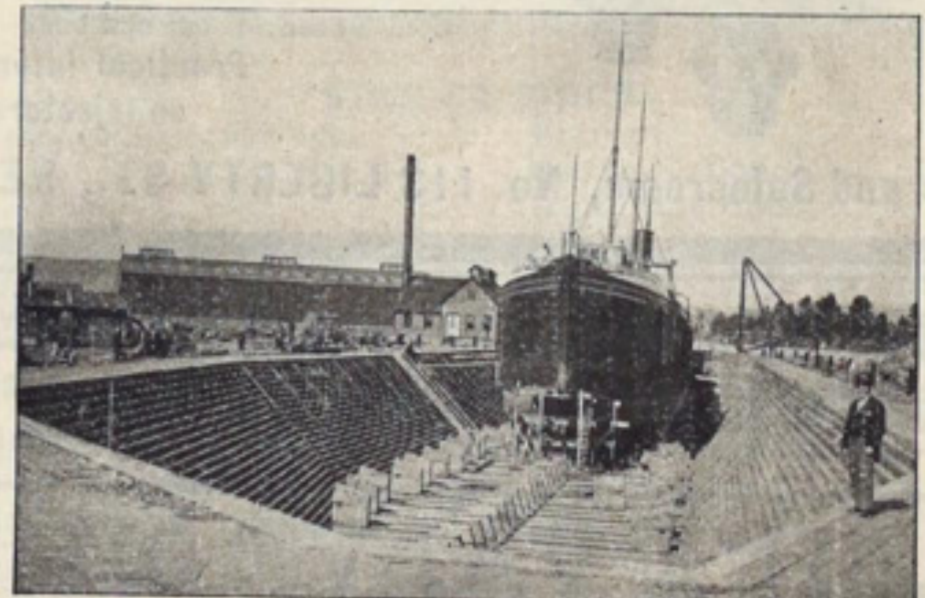
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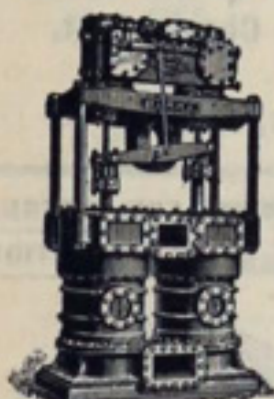
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